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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,760	06/06/2005	Fufang Zha	2002P87059WOUS	5173
28524	7590	05/19/2010	EXAMINER	
SIEMENS CORPORATION INTELLECTUAL PROPERTY DEPARTMENT 170 WOOD AVENUE SOUTH ISELIN, NJ 08830			MENON, KRISHNAN S	
ART UNIT		PAPER NUMBER		1797
MAIL DATE		DELIVERY MODE		05/19/2010 PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/537,760	ZHA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Krishnan S. Menon	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 11 May 2010.

2a) This action is **FINAL**.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-3,6,9-14 and 17-56 is/are pending in the application.

4a) Of the above claim(s) 23-34,36-39 and 49-53 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) see OA is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_.

## DETAILED ACTION

Claims 1-3, 6, 9-14, 17, and 20-56 are pending as amended 1/19/10 in the RCE of 6/15/09; claims 23-34, 36-39 and 49-53 are withdrawn from consideration. Claims 1, 12, 35, 40 and 41 are independent among the elected claims.

Applicant had elected the species represented by figure 2 (presented below) for prosecution in response to the restriction requirement.

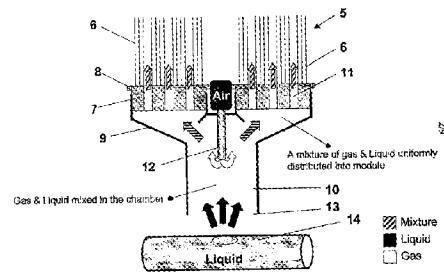


Figure 2.

**1. Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 (all actively pending claims)**  
**are rejected under 35 U.S.C. 103(a) as being unpatentable over the**  
**combination of Cote et al (US 2005/0006308) in view of Zha et al (US**  
**2001/0047962)**

This reference has a priority date backing to March 23, 2001 to the provisional application 60/278,007, a copy of which is provided in an 892.

Figure 1 of the provisional application is copied below.

Cote teaches a membrane filtration apparatus comprising plurality of filtration modules in an array (see the figures in the reference and the provisional application), the modules are encased in headers on upper and lower ends, permeate can be withdrawn from both top and bottom headers.

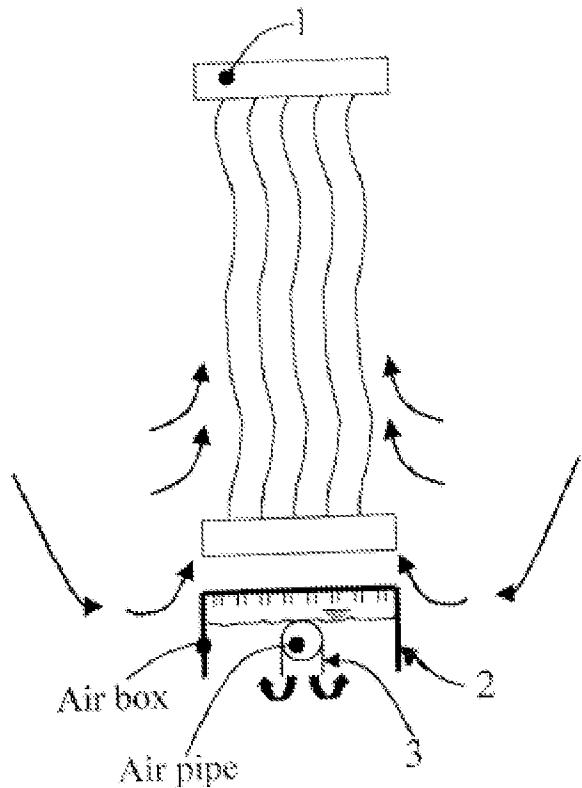


Figure 1

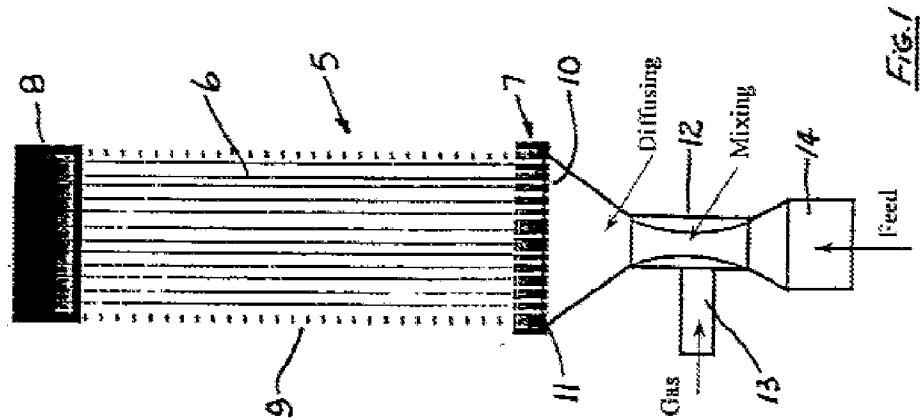
Air distribution header with plurality of apertures: aeration box 2 with apertures (5: Fig. 2). Air supply manifold (3) has an aperture which is facing downward as claimed. Cote teaches that air holes 5 on box 2 may be sized to have box 2 empty of air during the lower air flow periods, which allow tank water to flow through the holes 5. This is the condition recited in applicant's claims. See paragraphs 0014-0018 of the provisional application.

Cote does not teach a support structure (such as the wire cage disclosed by the applicant) or that the air holes are in the potting of the lower header. However, such details are also well known, and also taught by Zha as shown infra, in rejection 2.

It would be obvious to combine the teachings of Zha and Cote to arrive at applicant's invention because of the advantages of the Cote air distribution system (advantages of the cyclical low and high flow of air) with the Zha design allowing air to flow to the roots of the fibers. The membrane support system is also well known and is not a patentable difference. One would have the support system such as a cage to prevent excessive lateral movements of the fibers that could lead to fiber damage.

**2. Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zha et al (US 2001/0047962) in view of Shimizu, and further evidenced by Cote et al (US 2005/0006308).**

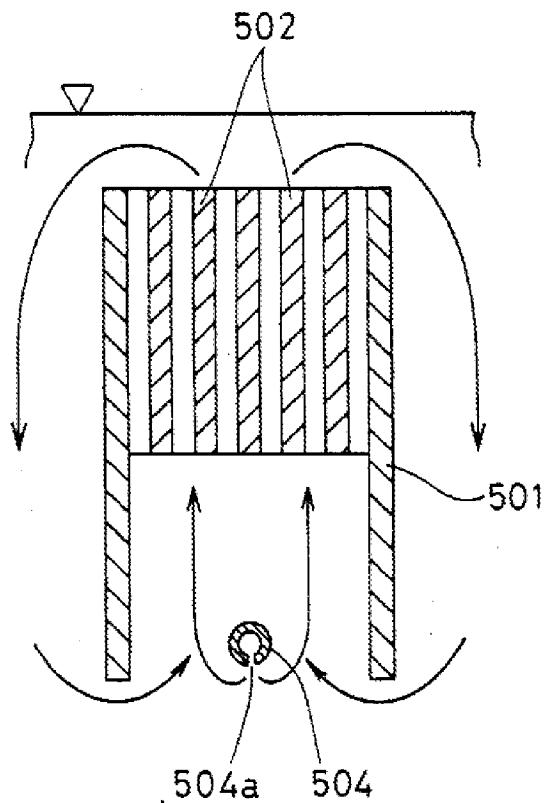
Zha teaches the membrane module as claimed – see the figures, particularly, figures 1, 2 and 9. the opening sizes in the tube potting heads are in the range as claimed (paragraph 0020). Deflector for the gas – see the jet assembly 57 described in paragraph 0061. Packing density as claimed – paragraph 0019. The open-ended mixing chamber as claimed –s identified in the figure below.



The gas source and the gas source being integral or among the porous membranes - see the figures 2,7, and 8 in the Zha reference - the structure of the gas source in these figures appear to be similar as in instant fig 2, except that they are upward.

Having the air nozzle inverted (upside-down) is obvious over Shimizu, as shown infra.

Shimizu teaches a submerged flat membrane system having aeration from the bottom, with the air inlet directed downward – see the figure reproduced below.



Shimizu teaches:

"This arrangement is advantageous in that because bubble of aeration gas spurted downward from the diffusing port rises without generating swirl even when a distance between the lower end of the membrane cartridges and the diffuser is short, such bubble is evenly supplied in the gaps between the membrane cartridges fast enough to prevent sludge from being adhered to the surface of the membrane."

It would be obvious to one of ordinary skill in the art at the time of invention to combine this teaching of Shimizu in the teaching of Zha to have the air inlet set inside the chamber downward to have the advantages taught by Shimizu. Having an air line into the chamber to provide for the air outlet, and how to place the air line with respect to the header or the membranes would be obvious to one of ordinary skill, and could be designed based on convenience.

Such design of the inverted gas nozzles is also taught by Cote as follows:

Cote reference has a priority date back to March 23, 2001 to the provisional application 60/278,007, a copy of which is provided in an 892.

Figure 1 of the provisional application is copied below.

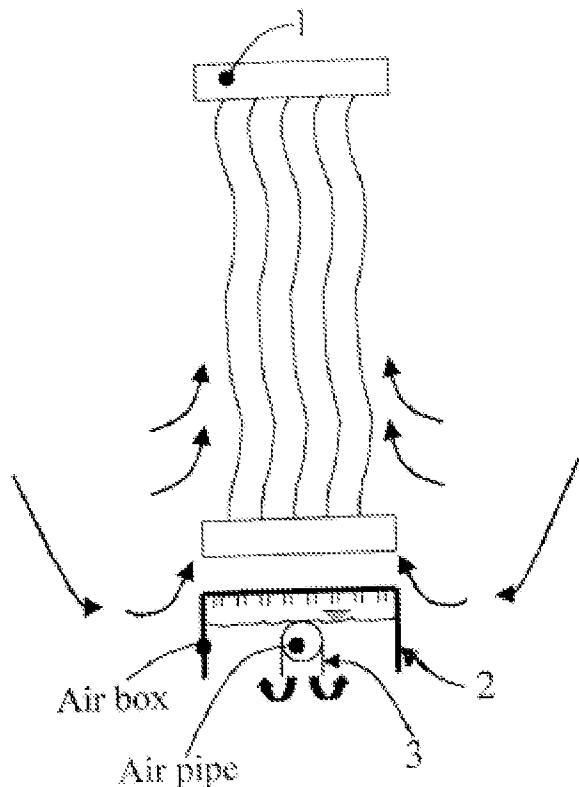


Figure 1

Cote teaches a membrane filtration apparatus comprising plurality of filtration modules in an array (see the figures in the reference and the provisional application), the modules are encased in headers on upper and lower ends, permeate can be withdrawn from both top and bottom headers.

Air distribution header with plurality of apertures: aeration box 2 with apertures (5: Fig. 2). Air supply manifold (3) has an aperture which is facing downward as claimed. Such downward-facing submerged air nozzles have the advantage of (1) preventing water from entering the nozzle and filling the manifold during low or no air flow periods, and (2) it provides a wider upward air distribution and prevent shooting of air upward as is the case when the nozzle is facing upward. The down-ward facing air nozzles is a commonly known design.

Having integral gas source to the header is also taught by Espenan US 2002/0189999 - see figures. Thus having gas source as "integral" to the header is not inventive, and is well known.

The "clover-typ" is only a change in shape without any particular function or advantage, and is not patentable as shown in rejection 1 above.

Argument that one would not replace the venture or jet of Zha with the air diffuser of Shimizu is not persuasive: Zha teaches jet type air nozzles as well (see paragraph 0046, on top of page 4) which force gas into liquid (unlike the venturi, which pulls gas by creating a vacuum) and such nozzles of Zha could be inverted in the fluid flow path to obtain the same benefits taught by Shimizu, which includes better distribution of air as well as prevent the nozzle from clogging by the settling particles in water, particularly when the air flow is stopped).

In any case, the argument about no motivation to combine is not persuasive: motivations are clearly stated in the office action. More over, incorporating known elements in a combination is *prima facie* obvious.

**3. Claims 1- 3, 6, 9-14, 17,20-22, 35, 40-48, and 54-56 are rejected under 35**

**U.S.C. 103(a) as being unpatentable over Zha and/or Cote in view of Shimizu as applied above, and further in view of Henshaw (US 5,783,083).**

Some of the claims in the above list differ from the teaching of Heine and/or Zha in having plural modules arranged in differently shaped manifolds. Henshaw teaches plurality of submerged membrane modules arranged in manifolds to have enlarged capacity treatment systems. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Henshaw in the teaching of Hein or Zha for the purpose of having larger treatment systems/reactors as taught by Henshaw.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1- 22, 35, 40-48, 54-56 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the pending claims of copending Application No. 11/025,418 in view of Shimizu. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '418 application recite the limitations of the instant claims. Having the air inlet downward is not patentable as shown above in rejection 1.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

In response to the argument that applicant will file a TD when the application becomes in condition for allowance: the double-patenting rejection cannot be withdrawn until applicant clears the double patenting rejection by filing a TD or otherwise.

### ***Response to Arguments***

Applicant's arguments filed 5/11/10 have been fully considered but they are not persuasive.

In response to the argument:

There can be no *prima facie* case of obviousness of claims 1-3, 6, 9-14, 17, 20-22, 35, 40-48, and 54-56 over Cote in view of Zha, or over Zha in view of Shimizu and further evidenced by Cote because these asserted combinations fail to disclose or suggest each and every element of any of these claims. Further, one of ordinary skill in the art would not have been motivated to have combined Cote and Zha, or Zha and Shimizu in the manner asserted by the Examiner *ob initio*.

It is suggested that applicant provide an explanation of which element of which claim is not taught by the references cited. It is also suggested that applicant provide a reason why the Examiner's asserted motivation is plausible.

A. The asserted combinations of Cote in view of Zha, and Zha in view of Shimizu allegedly further evidenced by Cote, both fail to disclose or suggest a plurality of filtration modules mounted in a common manifold and supplied with a gas/liquid mixture from a single mixing chamber, or an air inlet passing through the manifold and into the mixing chamber from above.

It is suggested that applicant point out which all claims have this limitation, and how this is supported in the specification. **This entire argument appears to be based on new matter.** However, this type of claim language is not patentable. Regarding the single mixing chamber providing gas to plurality of modules – see the figures in Cote, particularly, figures 3 and 7. Regarding the Zha reference, see the paragraph copied below:

[0059] Referring to FIGS. 9 and 10 of the drawings, the module 45 comprises a plurality of hollow fiber membrane bundles 46 mounted in and extending between an upper 47 and lower potting head 8. The potting heads 47 and 48 are mounted in respective potting sleeves 49 and 50 for attachment to appropriate manifolding (not shown). The fiber bundles 46 are surrounded by a screen 51 to prevent excessive movement between the fibers.

This description is similar to applicant's disclosed plurality of membrane modules.

B. Neither Cote and Zha, nor Zha and Shimizu allegedly further evidenced by Cote, are properly combinable as asserted *ab initio*.

This argument is not supported by any evidence, and the arguments are not commensurate in scope with the rejection, and assume bodily incorporation of structures, and elements not recited in the claims.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, for example, it would be obvious to combine the teaching of Zha with the teaching of Cote to have a cage for the cote modules to prevent excessive lateral movement of the membranes which are deemed detrimental to the membranes by Zha.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797